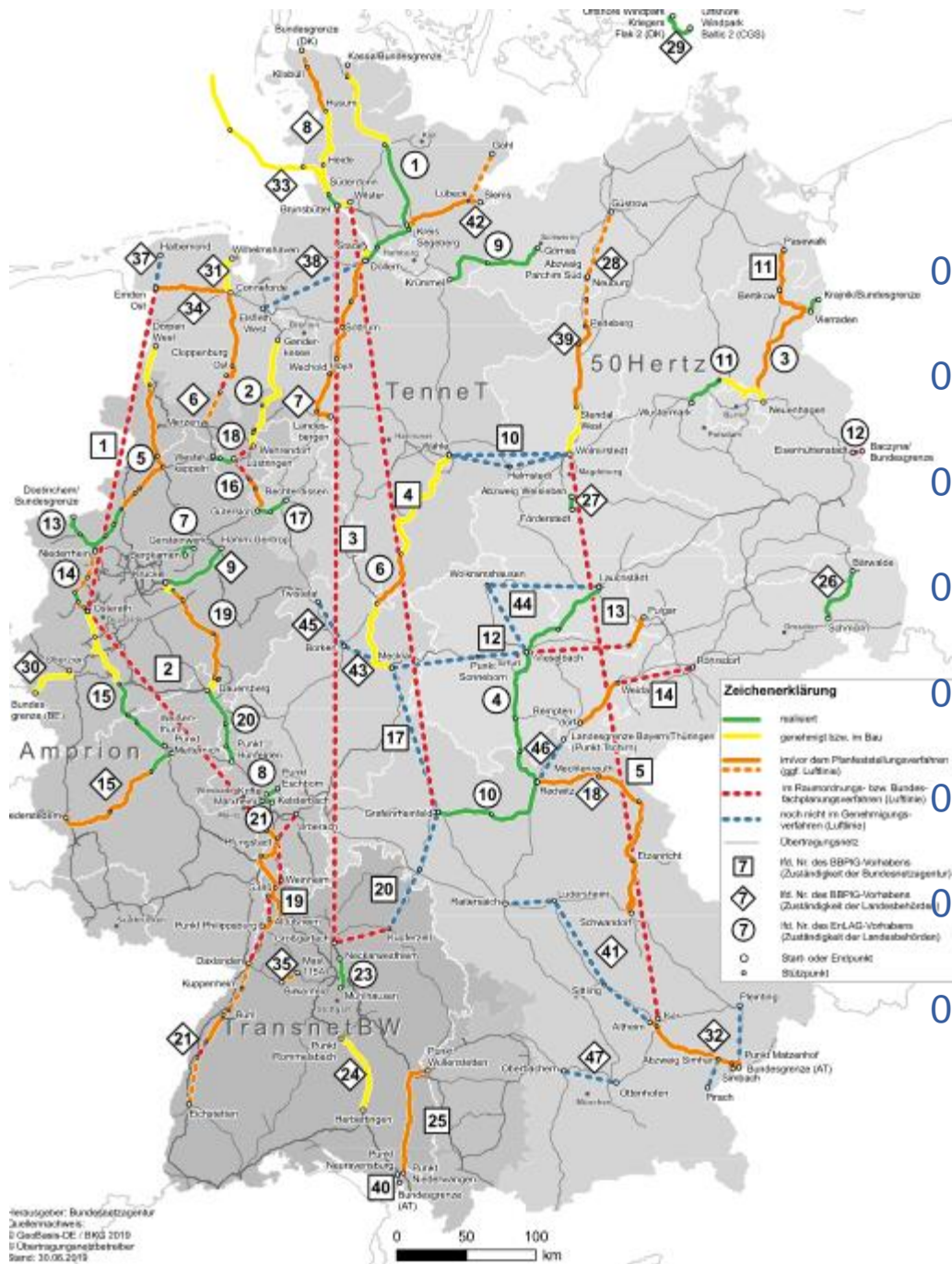


Digital technology to enable the energy transition

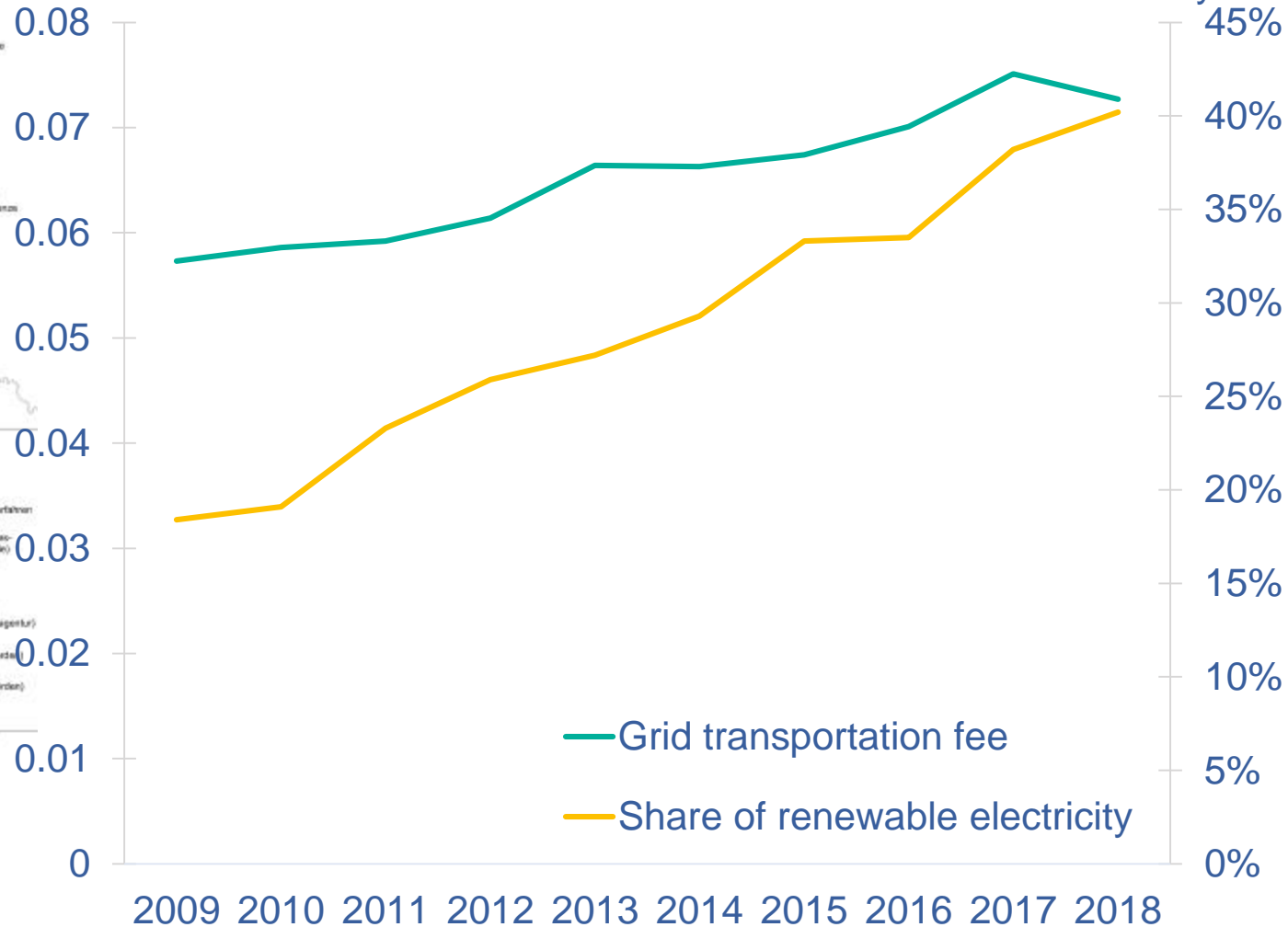


Dr Arij van Berkel



Grid transport fee
(EUR per kWh)

Share of renewable electricity



— Grid transportation fee
— Share of renewable electricity



Uncover Invisible Insights

Upskill Humans

Predict the Future

Make Information Accessible

Optimize

Automate

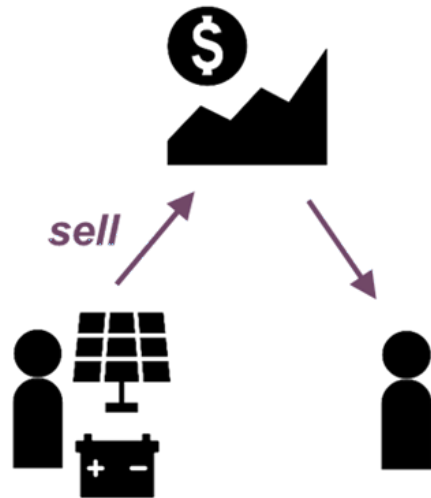
USE CASE EXAMPLES	CORE CAPABILITIES ENABLED BY DIGITAL TRANSFORMATION						IMPORTANCE TO THE ENERGY TRANSITION
	Uncover Invisible Insights	Predict the Future	Optimize	Upskill Humans	Automate	Make Information Accessible	
<i>Planning & Design</i>							
Wind farm layout optimization							Moderate
Renewables production forecasting							High
Distribution system simulation and modeling							Moderate
<i>Operations</i>							
Robotic inspection of PV and wind							Moderate
Active network management							High
PV tracking optimization							Moderate
PdM for grid infrastructure							Low
<i>Customer Engagement</i>							
Home energy monitoring							Low
P2P energy trading							High
Energy preferences in P2P energy trading							Low



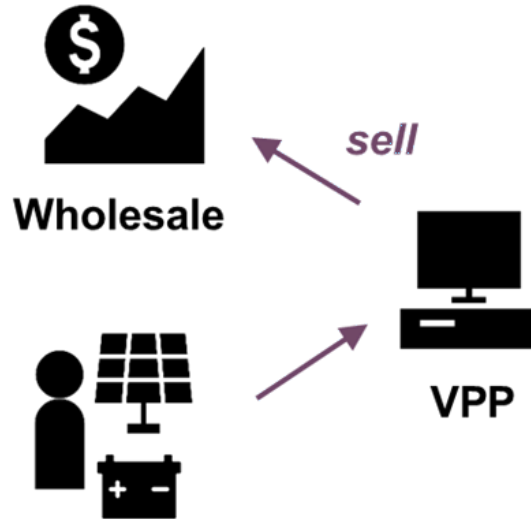
P2P Energy Trading



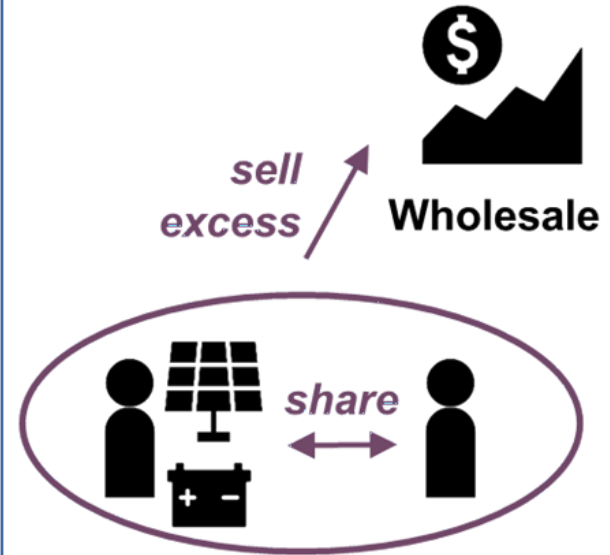
DER Market



Virtual Power Plant



Community Energy



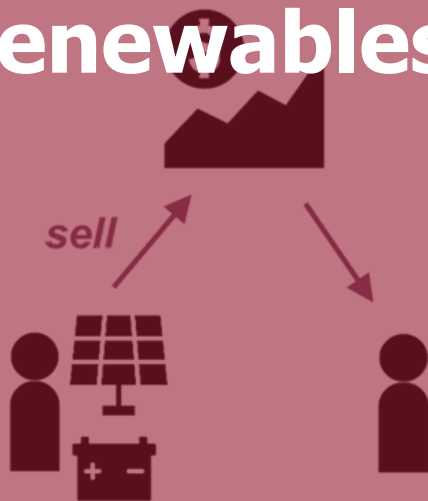


P2P Energy Trading

Adapting the grid to intermittent renewables



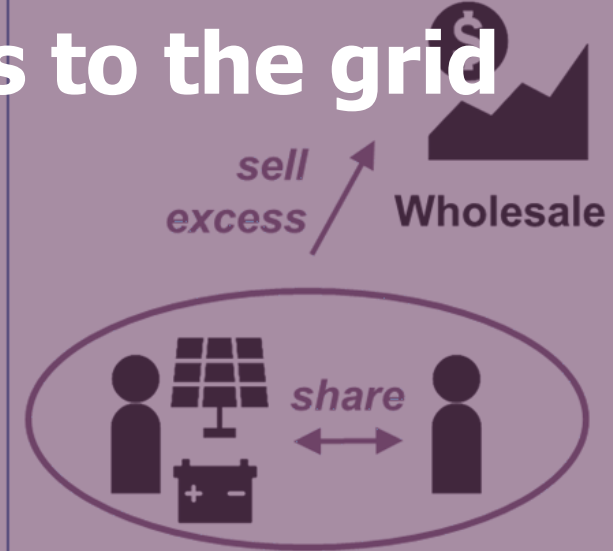
DER Market



Virtual Power Plant



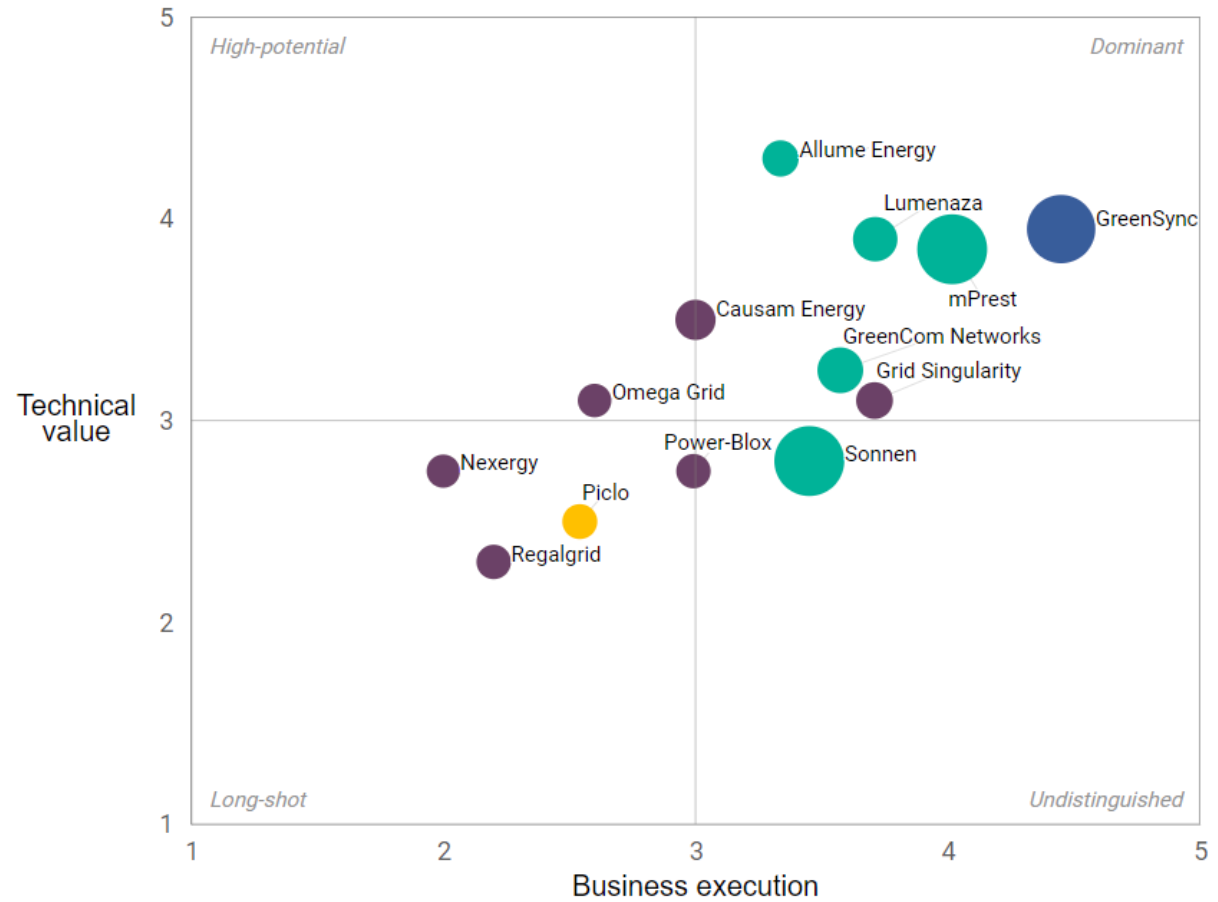
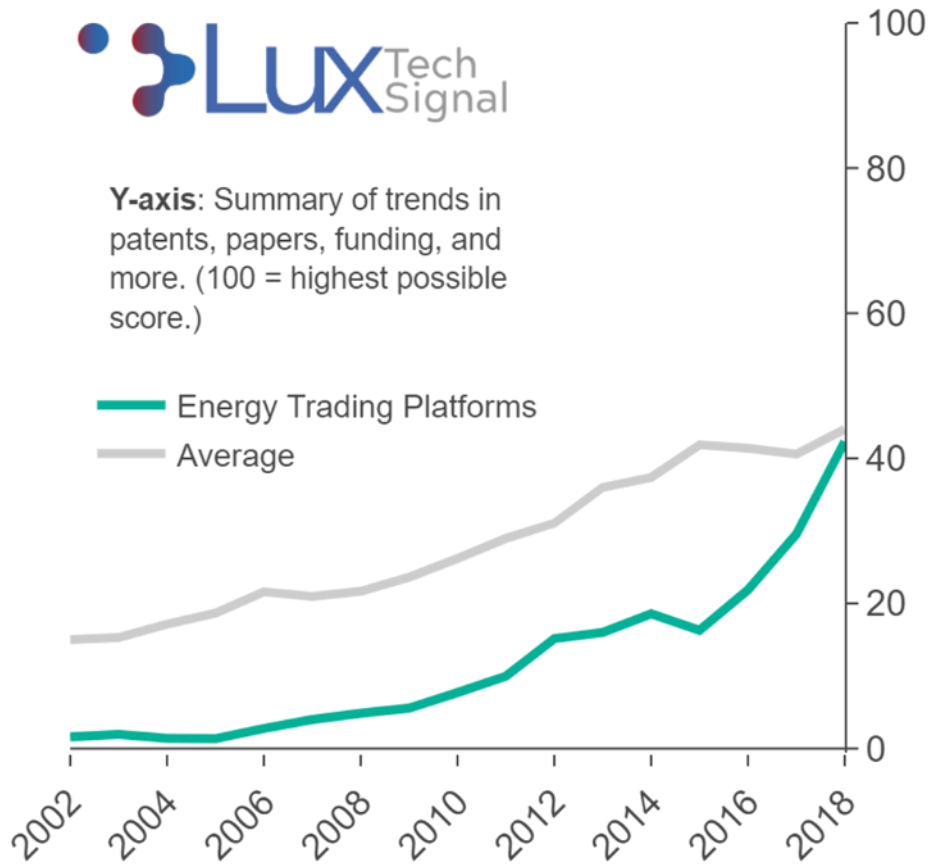
Community Energy



Adapting intermittent renewables to the grid



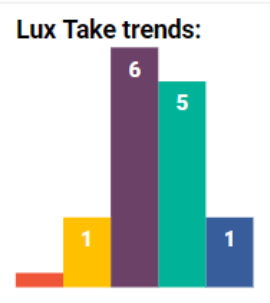
Y-axis: Summary of trends in patents, papers, funding, and more. (100 = highest possible score.)



Lux Take legend:

- Strong Positive
- Positive
- Wait and See
- Caution
- Strong Caution

Size of each circle corresponds to firm's relative maturity.





Jessica Hernandez
Future Grid [More...](#)
March 20, 2019 | [Edit](#)

Average importance ⓘ

Vattenfall acquires energy trading software developer Senfal

Vattenfall acquired a 100% stake in Senfal, a developer of energy trading software powered by artificial intelligence, aiming to service industrial customers by optimizing the flexibility of their energy participation. With the start-up's interest in tools to help developers that can leverage their expertise to benefit grid operators as well as their own customers.



Jessica Hernandez
Future Grid [More...](#)
February 13, 2019 | [Edit](#)

Equinor acquires energy trading company

Equinor finalized the acquisition of Danish power and gas trading company Danske Commodities. Equinor will leverage DC's footprint, which spans 37 European countries, and the company's expertise in the optimization of energy flows to manage Equinor's renewable assets. Similarly to other oil and gas companies, Equinor's interest will continue to expand outside the oil and gas space as it prepares itself to become more of a solutions provider with a larger renewables portfolio, which will include not only wind power assets but also solar and hydro.

Acquisition

more. (100)



Max Halik
Energy Storage [More...](#)
December 10, 2018 | [Edit](#)

LO3 Energy announces partnership with eMotorWerks/Energinet to allow energy trading for EVs and microgrids

eMotorWerks and LO3 recently announced a partnership to integrate the latter's Exergy platform with JuiceNet EV charging platform. An initial project will allow owners of electric vehicles to purchase electricity from microgrids; Exergy will manage the price signals and peer-to-peer matching, while JuiceNet will manage the systems involved. This is a predictable move from eMotorWerks as part of the Enel X brand, which provides energy management services to Enel's customers. At larger scale, this could mean reduced electricity costs for customers charging their vehicles and better payments for microgrid operators compared to the current situation for customer engagement and savings. For the original news article, [click here](#).

Partnership

Further reading from Lux Research: [Enel, eMotorWerks](#)



Max Halik
Future Grid [More...](#)
September 6, 2018 | [Edit](#)

Average importance ⓘ

Power Ledger begins first Asian trial of peer-to-peer energy marketplace

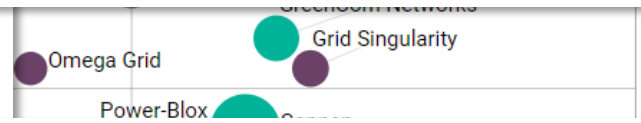
Power Ledger recently announced that it set up a peer-to-peer (P2P) energy trading marketplace in Bangkok, allowing electricity from solar modules rated for 635 kW to be traded within a group of businesses and apartments. In order to enable this pilot – one of the first of its kind in Asia – the startup partnered with Bangkok's municipal utility. As is common with energy trading schemes, bringing the right stakeholders onboard is crucial for success. Power Ledger claims 31 other projects lined up, but with a total capacity of only 2 MW, and expansion into other regions of SE Asia will be slow. Clients should take this announcement cautiously; it might be an indicator of P2P potential in Asia, but the market is still at early stages.

For the original news article, [click here](#).

Project

Further reading from Lux Research: [Power Ledger, Metropolitan Electricity Authority](#)

Very important ⓘ



Size of each circle corresponds to firm's maturity.



Jessica Hernandez
Future Grid [More...](#)
November 23, 2018 | [Edit](#)

Very important ⓘ

Tepeco Frontier Partners invests in peer-to-peer energy trading and online electricity marketplace platform developer Electrify

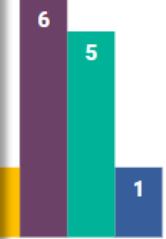
Tepeco's strategic investment comes right after the alpha test of Electrify's energy trading platform, called Synergy. Electrify is targeting Singapore initially, but it plans to expand to other countries afterward, including Japan; a collaboration opportunity with Tepeco will put Electrify's plan on the right track. Today, Electrify is taking advantage of Singapore's new open energy market to help citizens navigate the available energy retail options; after the launch of Synergy (planned for early 2019), consumers will also be able to purchase electricity from peers (electricity prosumers). Other Asian countries following the energy liberalization trend are likely to look at Singapore to shape their own future open energy markets.

For the original news article, [click here](#).

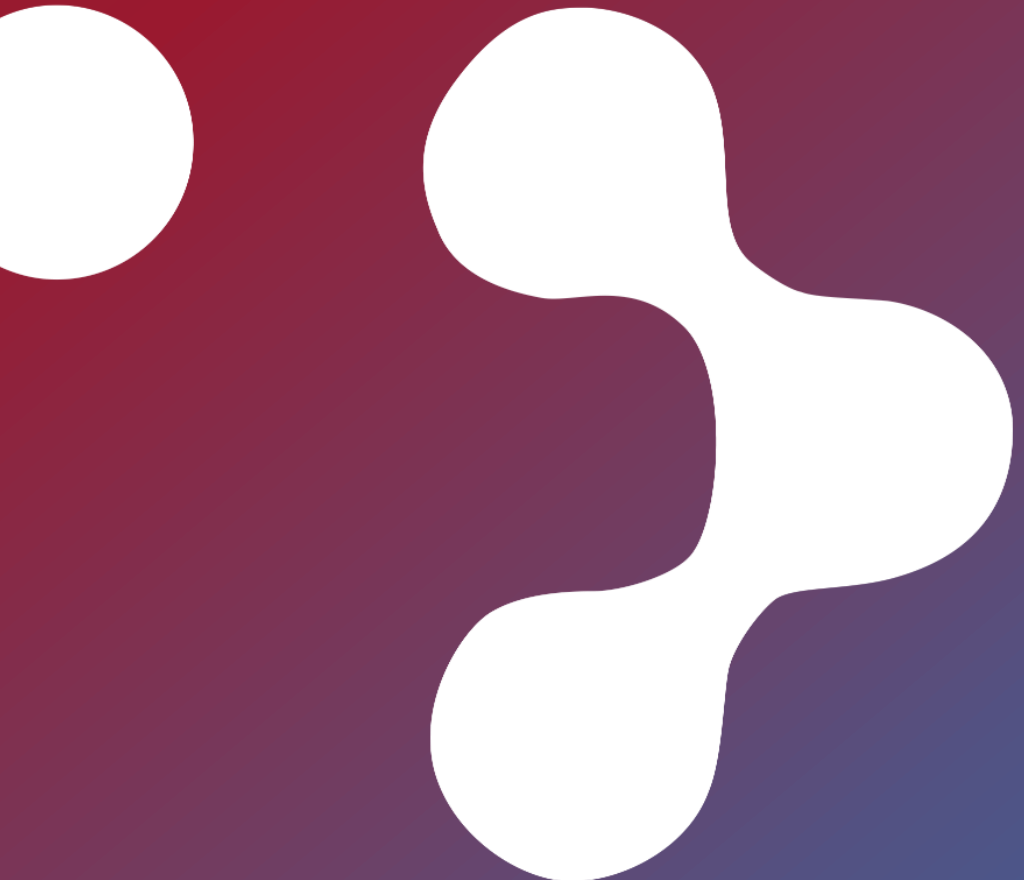
Investment Strategy

Further reading from Lux Research: [Electrify, Tepeco Frontier Partners](#)

Key trends:



2002



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